

NETTS PROJECT/DEMONSTRATION SUMMARY

Title: MTBE-Degrading Biobarriers/
Bioaugmentation, NCBC-25-98

Lead PI/Affiliation: Equilon Enterprises Ltd.

Co-PI's/Affiliations: ASU

Date/Duration:

Initiated - 05/98

Completed - 09/02 (est.)



Abstract:

Equilon's Westhollow Technology Center has teamed with Arizona State University to evaluate an in-situ process for bioremediation of methyl tertiary-butyl ether (MTBE).

Laboratory experiments and limited field studies have demonstrated that MTBE can be aerobically degraded by the Shell Development Company's mixed bacterial culture MC-100 (formerly BC-4). MC-100 naturally grows in activated sludge at industrial wastewater treatment plants. Bioreactor studies with MC-100 in the presence of oxygen have shown 99 % removal of MTBE from groundwater, based on a 25-hour retention time. The end products of the degradation are carbon dioxide and water.

The field trial, which is the first of its kind for treatment of MTBE, focuses on the use of MC-100 as an in-situ bio-barrier to downgradient MTBE migration. MTBE has been detected in the test area at concentrations ranging from 2,000 to 10,000 µg/L with no other contaminants present. The project design calls for the injection of a narrow band of MC-100 slurry into the aquifer followed by injection of oxygen.

The field test layout includes three 20' x 40' test cells aligned with the direction of groundwater flow. Each test cell contains 12 monitoring wells. These monitoring wells are used to collect groundwater data and samples for laboratory analyses to determine MTBE concentrations both up and downgradient of the treatment zone.

From late 1984 to early 1985, approximately 10,800 gallons of gasoline leaked from two storage tanks and piping under the Naval Exchange (NEX) gas station at the Naval Base Ventura County Port Hueneme Site (NBVC). Since 1985, the Navy has taken actions to prevent any further damage to the environment from the leaks. The MTBE remediation technologies demonstrated at NBVC Port Hueneme Site are part of the overall strategy in the NEX Plume Management plan for containment and control of the plume to prevent any further damage to the environment.

Results/Conclusions:

Field tests are currently being conducted.

Publications:

- 1) Salanitro, J.P. et al., "Demonstration of the Enhanced MTBE Bioremediation (EMB) In Situ Process," presented at the Battelle, In Situ and On-Site Bioremediation, 5th International Symposium, San Diego, CA, April 19-22, 1999.